

# NASA helps invent revolutionary X-ray instrument

A three-year collaborative effort by NASA, industry and university researchers has resulted in the development of an instrument which can generate the world's most intense source of commercial X-rays.

Capable of generating beams that are more than 100 times the intensity of other conventional X-ray sources, the new instrument is expected to lead to improvements in biotechnology research and have a wide variety of applications.

The revolutionary invention was developed by researchers at Marshall Space Flight Center, X-Ray Optical Systems Inc. in Albany, N.Y., and the Center for X-Ray Optics of the

State University of New York.

"This new optical instrument provides something never before possible: a capability to control the direction of X-ray beams," explained Walter Gibson, professor of physics at the University of New York.

At the heart of the instrument is a new type of optics for X-rays called "Capillary Optics."

"The X-rays are controlled by reflecting them through tens of thousands of tiny curved channels or capillaries, similar to the way that light is directed through fiber optics," Gibson said. "Thus, we are able to concentrate the beams to suit the particular needs of the intended research or medical procedure."

Researchers at Marshall are using the newly developed X-ray instrument to determine the atomic structure of proteins which are the targets for drug design.

"Our current research efforts focus on many difficult public health problems such as cancer, AIDS and heart disease," said Daniel Carter of Marshall's Laboratory for Structural Biology. We expect this new technology to significantly accelerate the ability of researchers to gather the information necessary to design entire families of highly effective, disease-fighting drugs."

"As a result of working with NASA and the State University of New York at Albany, we

have developed X-ray optics which will provide important commercial benefits to a broad range of industries," said David Gibson, president of X-Ray Optics. "Many commercial applications of this new technology are possible, including better manufacturing control for semiconductor circuits, medical imaging, and improved forensics."

The high intensity X-ray beams will permit scientific and medical research to be performed in less time with higher accuracy. In some cases the research was not feasible in standard X-ray laboratories. Also, the instrument could permit the use of smaller, lower cost and safer X-ray sources.

## New external tank ready for testing

A new super lightweight external tank took an important first step toward flight Feb. 1 with the arrival of a special test article at NASA's Marshall Space Flight Center.

The Aluminum Lithium Test Article arrived at Marshall by barge for testing at the center's structural and dynamic test stand. Over the next six months, the test article will undergo pressure and other tests to simulate the launch environment to verify the structural design of the tank.

"This is a significant milestone for the Super Lightweight Tank program," said External Tank Project Manager Parker Counts. "We're excited about testing the special segment at Marshall and making a significant move toward flight certification and eventual first flight."

While the test article is only 40 feet long, compared to the 154 feet of an external tank, its diameter of 27 feet is the same. It also includes a new structural design. The test article is essentially a modified segment of the aluminum lithium liquid hydrogen tank with a liquid oxygen tank dome at one end.

The new external tank will be the same size as the current one but will be approximately 7,500 pounds lighter. "Each pound we can take from the external tank is one more pound we can take to orbit. This becomes especially important when launching the International Space Station into its proper orbit in 1997," Counts said.

The super lightweight tank will be constructed of aluminum lithium which is a lighter, stronger material than the metal alloy currently used. Taking advantage of the high strength, lower density properties of aluminum lithium, the walls of the hydrogen tank will be manufactured in an orthogonal waffle-like pattern.



This montage of Saturn, Dione, Tethys, Mimas, Enceladus, Rhea and Titan is just one of the many images available at the new Planetary Photojournal home page.

## Planetary images now available

One of the world's most popular photo collections—images of the planets produced by the U.S. space program—went online in a central location this month as part of a joint project between NASA and the U.S. Geological Survey.

NASA's Planetary Photojournal, accessible on the Internet via the World Wide Web, enables access to NASA's archive of planetary images for viewing and use by the public, scientists, educators and publishers.

"This Web site opens a fresh window on the planets and what we have learned from them," said Wesley Huntress, associate administrator for space science. "Communication is the final and probably the most important step in the scientific process. Using some of the same computer technology that helps us generate new discoveries, this partnership with the USGS will allow us to share this knowledge with people everywhere."

"The new system currently provides access to images residing in collections at the Jet Propulsion Laboratory and at the

USGS in Flagstaff, Ariz., along with captions and other information such as mapping data," said Sue LaVoie, a member of the development team at JPL.

The site features thumbnail and browse-size versions of the images for viewing and provides user-friendly digital downloading of images in a variety of formats and sizes.

Access is provided not only to the most popular images but to the entire primary image data sets from various space missions. Links are provided to commercial vendors for ordering hard copies of photographs, slides, CD-ROMs and other imaging data products from the collection. Other links in the new system allow users to jump to and browse other space image data collections, LaVoie said. Pointers and links to other sites, such as space mission home pages, also are featured.

Addresses for the new NASA Planetary Photojournal are:

<http://www-pdsimage.jpl.nasa.gov/PIA>  
<http://pdsimage.wr.usgs.gov/PIA>

## West becomes NASA chief information officer

Ronald West has been named chief information officer at NASA Headquarters effective March 3.

West will succeed John Lynn, who has announced his intention to retire after 40 years of government service. The CIO reports directly to the administrator and is responsible as an integrated agency focus for the development of information resource management strategies, policies and practices.

These encompass strategic planning; standards in computing, networking, and security; establishment of system and information architectures and incorporation of life-cycle management concepts into information technology acquisitions and management. In addition, the CIO serves as the senior official for Information Resource Management.

## O'Connor leaves NASA

Space Shuttle Director Bryan O'Connor announced last week that he will retire this month.

In making his announcement, O'Connor released the following statement.

"The current transition under way in the shuttle program management presents an occasion for me to leave NASA without causing a significant disruption.

"It has been an honor and privilege to work with the dedicated men and women who work on the shuttle program. It has been their exceptional work that has allowed 49 safe and successful missions since the shuttle's return to flight."

## AIAA seeks papers for technical symposium

The American Institute of Aeronautics and Astronautics is seeking papers to be presented at the 21st annual Technical Symposium to be held May 23 at the Center for Advanced Space Studies.

The theme of this year's symposium is "New Frontiers Through Technologies, Process and Paradigms."

Abstracts should be 250 words or less and must be double-spaced. Electronic submission, demonstrations and exhibits of hardware are encouraged. Presentations will be limited to 20 minutes. Vu-graphs or 35mm slides are preferred with handouts available.

Abstracts should be submitted with a NASA Form FF427 and a paper/author information sheet to Charles Teixeira, Mail Code EA63, email at [cteixeir@gp903.jsc.nasa.gov](mailto:cteixeir@gp903.jsc.nasa.gov) For information call Teixeira at x34647.

# Lead role means JSC must assume national perspective

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space operations lead center. O'Neill is the functional manager for agency space operations and for space operations facilities and systems, including worldwide space networks, mission and network control facilities, mission control facilities, data processing and planning systems and telecommunications systems.

The Space Operations Management Office has been concentrating initially on near-term cost-saving opportunities and planning and negotiation of streamlined and

consolidated space operations services across the agency. The overall goal is to develop cost effective mission services and strive toward a set of common services to support human, deep space and low-Earth orbit robotics missions.

"We're going to have to rely on a lot of people who are not just at this center, but who are contributing and making those programs happen at Kennedy, Marshall and Stennis," Abbey said. "We'll have to rely on them to do their part, and I think we have a very good working relationship with the

other center directors."

Another new JSC organization will be the Extravehicular Activity Projects Office, which will serve as the agency's lead for all space walk activities and provide services through agreements with the shuttle and station programs. The small office will be led by Don McMonagle, with Milt Heflin as his deputy.

Abbey said reductions in JSC's civil service and contractor work force are still going to be necessary, but that as the center takes on new responsibilities the losses may be offset to some degree, particularly as the

station program's Headquarters employees become part of JSC's base.

"This move reflects a lot of confidence and trust in the Johnson Space Center team and clearly causes us to have a perspective that's different than we've had in the past," Abbey concluded.

"We've had a perspective that's been more center oriented and, in taking on this responsibility, we have to take on more of a national perspective, a perspective that is more programmatic and looks at what's good for the country and for NASA."

## Atlantis rolls to VAB this month

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briefing will cover the latest findings from the Commercial Protein Crystal Growth experiment, scheduled to fly again on STS-75.

The STS-75 crew—Commander Andy Allen; Pilot Scott Horowitz; Payload Commander Franklin Chang-Diaz; Mission Specialists Jeff Hoffman, Claude Nicollier and Maurizio Cheli; and Payload Specialist Umberto Guidoni—will meet the press in a briefing beginning at 2 p.m.

A Feb. 22 launch date would lead to a 2:18 p.m. CST liftoff of *Columbia* on STS-75.

Meanwhile, work also is under

way at KSC to ready *Atlantis* for the third Mir docking mission, STS-76. Currently aimed at a mid-March launch, preparations this week included tests of the orbiter docking system and installation of the main engine heat shields.

The payload bay doors on *Atlantis* are scheduled to be closed for a final time prior to the flight on Wednesday, and the orbiter is planned to be rolled to the Vehicle Assembly Bldg. to be mated with the STS-76 solid rockets and fuel tank on Feb. 20.

Elsewhere, *Endeavour* is in KSC's Bay 3 processing hangar being prepared for a mid-May launch on STS-77.

## Space News Roundup

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## Payload specialists get nod

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STS-63 mission in February 1995. Roger Crouch and Gregory Linteris have been selected to fly as payload specialists on the 1997 Microgravity Science Laboratory mission.

Crouch is the lead microgravity scientist in NASA's Office of Life and Microgravity Sciences and Applications. The 55-year-old Crouch was an alternate payload specialist for STS-42, the first International Microgravity Laboratory mission.

Linteris is a mechanical engineer at the National Institute of Standards and Technology in Gaithersburg, Md., where he is responsible for advanced fire suppressants.

NASA has designated Paul Ronney of the University of Southern California to serve as a backup to Crouch and Linteris. As an alternate, Ronney will undergo the same training as Crouch and Linteris and will be ready to fly if needed.

The 16-day Spacelab mission is scheduled for *Columbia* on STS-83 in the spring of 1997. Crouch and Linteris will conduct more than 25 investigations in microgravity sciences, such as fluid physics, combustion science and materials science. Ronney will be crew interface coordinator in the Spacelab Mission Operations Control Center at Marshall Space Flight Center.